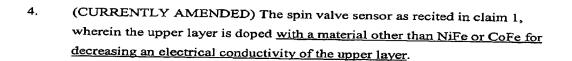
AMENDMENT TO THE CLAIMS:

This listing of claims will replace all prior versions of claims in the application:

LISTING OF CLAIMS:

- 1. (CURRENTLY AMENDED) A spin valve (SV) sensor comprising: a pinned layer having a pinned layer magnetization;
- a free layer disposed adjacent towards the pinned layer, the free layer having a free layer magnetization perpendicular to the pinned layer magnetization in the absence of an external field;
 - a spacer layer disposed between the free layer and the pinned layer;
- a pinning layer disposed adjacent towards the pinned layer for fixing the pinned layer magnetization;
- an underlayer disposed adjacent towards the pinning layer, the underlayer comprising NiFeX; and
- an upper layer disposed adjacent the underlayer and the pinning layer, the upper layer comprising a material selected from the group consisting of NiFe and CoFe for increasing a GMR ratio associated with the SV sensor;
 - wherein the upper layer-has-a thickness less than 20 A
- wherein the sensor provides an increase of $\Delta R/R$ of at least 7% when compared to an otherwise identical sensor not having the upper layer.
- 2. (CURRENTLY AMENDED) The spin valve sensor as recited in claim [[2]] 1, wherein the upper layer has a thickness of at least 4 A.
- (CURRENTLY AMENDED) The spin valve sensor as recited in claim [[5]] 1,
 wherein the upper layer has a thickness of no more than 10 A less than 5 A.





- (ORIGINAL) The spin valve sensor as recited in claim 1, wherein the underlayer 5. comprises NiFeCr.
- (ORIGINAL) The spin valve sensor as recited in claim 1, wherein the SV sensor 6. is a component of a disk drive system.
- (ORIGINAL) The spin valve sensor as recited in claim 1, wherein the underlayer 7. includes 40 +/- 5 Atomic % Cr.

ED) The spin valve sensor as recited in claim 1, wherein the planed layer comprises a Ru layer, a first includes 40 +/- 5 Atomic % Cr.

- 8. (CURRENTLY AMENDED) The spin valve sensor as recited in claim 1, wherein the pinned layer comprises a Ru layer, a first CoFe layer disposed adjacent a first side of the Ru layer and a second CoFe layer disposed adjacent a second side of the Ru layer.
- 9. (CURRENTLY AMENDED) The spin valve sensor as recited in claim 8; wherein the pinned layer further comprises a first CoFe layer disposed adjacent a first side of the Ru layer and a second CoFe layer disposed adjacent a second side of the Ru layer 1, wherein the upper layer includes both NiFe and CoFe.
- 10. (CURRENTLY AMENDED) The spin valve sensor as recited in claim 1, wherein the free layer comprises a NiFe layer the underlayer comprises NiFeX where X is not Cr.





- 11. (CURRENTLY AMENDED) The spin valve sensor as recited in claim 10; wherein the free layer further comprises a CoFe-layer disposed adjacent the NiFe layer 1, wherein the upper layer is non-magentic.
- (CURRENTLY AMENDED) A method of fabricating a spin valve (SV) sensor 12. comprising:

depositing an underlayer comprising NiFeX, where X is not Cr;

depositing an upper layer adjacent the underlayer, the upper layer comprising a material selected from the group consisting of NiFe and CoFe for increasing a GMR ratio associated with the SV sensor;

depositing a pinning layer adjacent towards the upper layer;

depositing a pinned layer adjacent towards the pinning layer, the pinned layer having a pinned layer magnetization;

depositing a spacer layer adjacent towards the pinned layer; and depositing a free layer adjacent towards the pinned spacer layer, the free layer having a free layer magnetization perpendicular to the pinned layer magnetization in the absence of an external field[[;]]

wherein the upper layer has a thickness less than 20 A.

- (ORIGINAL) The method as recited in claim 12, wherein the upper layer has a 13. thickness of at least 4 A.
- 14. (CURRENTLY AMENDED) The method as recited in claim 13, wherein the upper layer has a thickness of no more than 10-A 20 A.
- (CURRENTLY AMENDED) The method as recited in claim 12, wherein the 15. upper layer is doped with a material other than NiFe or CoFe for at least one of reducing an electrical conductivity of the upper layer and reducing magnetic properties of the upper layer.



- 16. (CURRENTLY AMENDED) The method as recited in claim 12, wherein the underlayer includes NiFeCr upper layer includes both NiFe and CoFe.
- 17. (CURRENTLY AMENDED) A spin valve (SV) sensor comprising:
 - a pinned layer having a pinned layer magnetization;
- a free layer disposed adjacent towards the pinned layer, the free layer having a free layer magnetization perpendicular to the pinned layer magnetization in the absence of an external field;
 - a spacer layer disposed between the free layer and the pinned layer;
- a pinning layer disposed adjacent towards the pinned layer for fixing the pinned layer magnetization, the pinning layer comprising PtMn;
- an underlayer disposed adjacent towards the pinning layer, the underlayer comprising NiFeCr; and
- an upper layer disposed adjacent the underlayer and the pinning layer, the upper layer comprising CoFe for increasing a GMR ratio associated with the SV sensor; wherein the upper layer has a thickness less than 20 A 5 A.
- 18. (CURRENTLY AMENDED) A spin valve (SV) sensor comprising: a pinned layer having a pinned layer magnetization;
- a free layer disposed adjacent towards the pinned layer, the free layer having a free layer magnetization perpendicular to the pinned layer magnetization in the absence of an external field;
 - a spacer layer disposed between the free layer and the pinned layer;
- a pinning layer disposed adjacent towards the pinned layer for fixing the pinned layer magnetization, the pinning layer comprising PtMn;
- an underlayer disposed adjacent towards the pinning layer, the underlayer comprising NiFeCr; and

an upper layer disposed adjacent the underlayer and the pinning layer, the upper layer comprising at least one of NiFe and CoFe for increasing a GMR ratio associated with the SV sensor;

wherein the upper layer has a thickness less than [20 A] 5 A.

- 19. (CURRENTLY AMENDED) A spin valve (SV) sensor comprising:
 - a pinned layer having a pinned layer magnetization;
- a free layer disposed adjacent towards the pinned layer, the free layer having a free layer magnetization perpendicular to the pinned layer magnetization in the absence of an external field;
- a pinning layer disposed adjacent towards the pinned layer for fixing the pinned layer magnetization;
- an underlayer disposed adjacent towards the pinning layer, the underlayer comprising NiFeCr; and

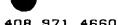
an upper layer disposed adjacent the underlayer and the pinning layer, the upper layer comprising a material selected from the group consisting of NiFe and CoFe for increasing a GMR ratio associated with the SV sensor;

wherein the upper layer has a thickness at least 4 A and less than 20A; wherein the upper layer is doped with a material other than NiFe or CoFe for reducing at least one of an electrical conductivity of the upper layer and magnetic properties of the upper layer.

- 20. (CURRENTLY AMENDED) A spin valve (SV) sensor comprising:
- a pinned layer having a pinned layer magnetization, the pinned layer comprising a Ru layer with a first CoFe layer disposed adjacent a first side of the Ru layer and a second CoFe layer disposed adjacent a second side of the Ru layer;
- a free layer disposed adjacent towards the pinned layer, the free layer having a free layer magnetization perpendicular to the pinned layer magnetization in the absence



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of an external field, the free layer comprising a NiFe layer with a third CoFe layer disposed adjacent thereto;

a spacer layer disposed between the free layer and the pinned layer;

a pinning layer disposed adjacent towards the pinned layer for fixing the pinned layer magnetization, the pinning layer comprising PtMn;

an underlayer disposed adjacent towards the pinning layer, the underlayer comprising NiFeCr; and

an upper layer disposed adjacent towards the underlayer and the pinning layer, the upper layer comprising a material selected from the group consisting of NiFe and CoFe for increasing a GMR ratio associated with the SV sensor;

wherein the upper layer has a thickness less than 20 A;

wherein the upper layer is doped with a material other than NiFe or CoFe for reducing at least one of an electrical conductivity of the upper layer and magnetic properties of the upper layer;

wherein the sensor provides an increase of $\Delta R/R$ of at least 7% when compared to an otherwise identical sensor not having the upper layer.

- (CURRENTLY AMENDED) A disk drive system, comprising: 21.
 - a magnetic recording disk;
 - a spin valve (SV) sensor including:
 - a pinned layer having a pinned layer magnetization;
 - a free layer disposed adjacent towards the pinned layer, the free layer having a free layer magnetization perpendicular to the pinned layer magnetization in the absence of an external field,
 - a spacer layer disposed between the free layer and the pinned layer,
 - a pinning layer disposed adjacent towards the pinned layer for fixing the pinned layer magnetization,
 - an underlayer disposed adjacent towards the pinning layer, the underlayer comprising NiFeX, and



an upper layer disposed adjacent the underlayer and the pinning layer, the upper layer comprising a material selected from the group consisting of NiFe and CoFe for increasing a GMR ratio associated with the SV sensor; an actuator for moving the SV sensor across the magnetic recording disk so the SV sensor may access different regions of magnetically recorded data on the magnetic recording disk; and

a controller electrically coupled to the SV sensor for detecting changes in resistance of the SV sensor;

wherein the upper layer has a thickness less than 20 A;

wherein the sensor provides an increase of AR/R of at least 7% when compared to an otherwise identical sensor not having the upper layer.